

PERCEIVED RELATIONAL RISK AND PERCEIVED SITUATIONAL RISK SCALES

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Note: For details about the scale development see: Stuck, R. E. (2020). *Perceived Relational Risk and Perceived Situational Risk: Scale Development* (Doctoral Dissertation, Georgia Institute of Technology).

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Motivation

As automation and technology increase in our daily lives, it is crucial to understand how to support the appropriate use of technologies and understand the components that impact human-automation interaction. Trust is a key component of this interaction. However, trust is a complicated construct with a variety of factors that influence it; so, too, is the impact trust has on our interactions (Hoff & Bashir, 2015; Lee & See, 2004; Parasuraman & Riley, 1997). Risk is one of these key factors that influences both trust and interactions with the technology (Stuck & Walker, 2020).

As risk is a key factor for trust, it is essential to incorporate risk—and measures of perceived risk—into studies of trust (Stuck & Walker, 2020). Perceived risk in the trust relationship has been differentiated into two different constructs: perceived *situational* risk and perceived *relational* risk (Stuck, Tomlinson, & Walker, 2020). Measurements exist for perceived risk of hazards (Jacoby & Kaplan, 1972; Slovic, 1987; Wilson, Zwickle, & Walpole, 2019), as well as risk-taking behaviors (Weber & Blais, 2006; Weber, Blais, & Betz, 2002). However, there are no scales developed to

measure perceived risk within the context of individual interactions with a specific technology or a specific task. It is unclear if the same measures for understanding perceived risk of hazards will also be valid for contexts exploring perceived risk with technologies. In addition, limited construct validation and exploration of test-retest reliability has been conducted for those scales.

To appropriately study and understand trust, and interactions with technologies, it is essential to measure both perceived relational and situational risk. However, this cannot be done if there are no validated scales to measure these constructs. Stuck's (2020) dissertation, on which this technical report is based, addressed those gaps through the development and validation of scales for perceived relational risk and perceived situational risk.

Summary of Research

These scales were developed and evaluated for validity in one overarching study. First, items for each of the perceived relational and situational risk scales were developed. These items covered a variety of components which could impact risk perception: affect, perceived severity with weighted probability, and domain.

The study was administered online study via Qualtrics. Through Mechanical Turk 201 participants were recruited and completed the survey. After removal for attention check failures, 177 participants were included in the final analysis. Each participant completed the perceived relational risk scale for one low-risk technology (calculator) and one high-risk technology (electronic cigarette). For perceived situational risk, participants were asked about one low-risk task/situation (listening to music) and one high-risk task/situation (drinking until blackout drunk). Participants also completed a variety of other scales about the technologies and tasks including: a general measure of perceived risk scale (for comparison and construct validity), positive and

negative affect schedule (PANAS), participant's self-proposed list of expected negative outcomes, trust in the technologies (Jian, Bisantz, Drury, & Llinas, 1996), and answered questions about past experience as well as potential intent to use the technology (relational) or complete a task (situational) in the future. In addition, participants answered general demographic questions, the ten-item personality inventory, the domain specific risk-taking scale (DOSPERT), and propensity to trust (Evans & Revelle, 2008). After completing demographics and other scales, participants were randomly assigned to repeat the perceived relational risk scale for one technology and the perceived situational risk scale for one task/situation.

The perceived relational risk and situational risk scales were evaluated to assess the internal validity, test-retest reliability, and construct validity of the items. The items for both scales were found to have excellent internal validity and acceptable test-retest reliability. Construct validity was confirmed through both the correlations with the General Perceived Risk measure (Wilson, Zwickle, & Walpole, 2019) and through validating that the scale was able to appropriately capture differences in the low-risk versus high-risk manipulation.

After the evaluation of the scale items showed that the items were reliable and valid, a final set of items was determined for Perceived Relational Risk and Perceived Situational Risk scales. Besides these full items sets, a smaller subset of items was selected for a shorter scale for practitioners who may have time and resource constraints.

Perceived Relational Risk: How to use the Scale

The perceived relational risk scale was developed to understand risk perceptions of technologies. To utilize the scale, the name of the technology needs to be placed throughout the scale, where specified. The scale was designed with the intention to be applicable to both broad

types of technologies (e.g., smart phone), as well as specific brands of technologies (e.g., iPhone X).

Scale Calculations and Totals

For the affect items, it is necessary to reverse code the positively worded items. Then average the scale items scores together. An average score close to 1 represents very little perceived risk and an average score close to 7 represents a very high perceived risk.

For the Probability x Severity items, the probabilities assigned to each level of severity will be used as the weighting, which can be between 0-10. The items are assigned values as response items in Likert scales (e.g., 5-Extremely, 4-Very, 3-Somewhat, 2-Slightly, 1-Not at all). The probability weighting will be multiplied by the level of the Likert scale, and then divided by 10 since that is the total of probabilities assigned. This will be done for each item and then these scores will be totalled for the overall score for that individual.

For example, if an individual assigned the following weights:

- (5) The outcomes of using this technology will be extremely risky. 5
- (4) The outcomes of using this technology will be very risky. 3
- (3) The outcome of using this technology will be somewhat risky. 2
- (2) The outcomes of using this technology will be slightly risky. 0
- (1) The outcomes of using this technology will not be risky at all. 0

The individual's score for how risky the technology is would be $((5*5)/10) + ((4*3)/10) + ((3*2)/10) + ((2*0)/10) + ((1*0)/10) = 4.3$. You will then create an average of all the scores for all 9 items. An average value close to 1 represents no perceived risk and an average value close to 5 indicates a very high perceived risk.

For the domain items, calculate the average ranking for each item to determine which of the domains were considered the most important to the least important. If utilizing the cut-off, one can also look at the frequencies of each domain that was considered as a domain that needed to be considered to also determine which domains are the most pertinent.

These calculations can be utilized for both the full scale and the short scale.

Perceived Situational Risk: How to use the Scale

The perceived situational risk scale was developed to understand risk perceptions of the situation or task in which a technology might be used. To utilize the scale, a description or summary of either the situation or task needs to be created. This should be done without explicitly including the technology. For example, if a researcher is trying to understand risk perception of using virtual reality headsets in fully-automated cars: the situation/task would be how risky riding in a fully-automated car would be without the ability to monitor or see the environment. To understand the risk perceptions of the technology—utilize the perceived relational risk scale. The scale was designed with the intention to be applicable to both broad types of technologies (e.g., smart phone), as well as specific brands of technologies (e.g., I-phone X).

Scale Calculations and Totals

All calculations will be conducted in the same way that they were for perceived relational risk. See 1.3.1. These calculations can be used for both the full scale and short scale for perceived situational risk.

Conclusion

The research community will now be able to thoroughly investigate the nuanced impact of perceived relational and situational risk on trust, as well as their relationship to technology adoption and usage, through more rigorous methods than previously available. Since this scale is standardized and applicable to many risk contexts, future studies should use this scale to compare results in order to thoroughly understand the impact of design choices on risk and trust.

The relationship of perceived risk with trust can now be further understood and explicated. For example, by developing scales to measure these constructs separately, we can better understand the interaction of the risk of the environment and the risk of the technology on reliance behavior.

APPENDIX A. PERCEIVED RELATIONAL RISK: FULL SCALE

A.1 Affect Items

Rated on level of agreement with each statement: (1-Strongly disagree, 2-Disagree, 3-Somewhat disagree, 4-Neither agree nor disagree, 5-Somewhat agree, 6-Agree, 7-Strongly agree).

Negative Items

1. I am very concerned about using this technology.
2. I am very fearful of using this technology.
3. I am very anxious about using this technology.
4. I am very nervous about using this technology.
5. I am very concerned about the effects that using this technology could have on me.
6. I am very concerned about the effects that using this technology could have on people close to me (e.g., friends and family).
7. I am very concerned about the effects that using this technology could have on the general public.
8. Thinking about using this technology makes me feel very distressed.
9. Thinking about using this technology makes me feel very worried.
10. Thinking about using this technology makes me feel very frightened.

Positive items

1. Thinking about using this technology does not worry me at all.
2. Using this technology is not threatening to me at all.
3. I have no concerns about the effects that using this technology could have on me.
4. I have no concerns about the effects that using this technology could have on people close to me (e.g., friends and family).
5. I have no concerns about the effects that using this technology could have on the general public.
6. I am calm when thinking about using this technology.
7. I do not feel any anxiety when thinking about using this technology.
8. I feel peaceful when thinking about using this technology.
9. I do not feel any distress when thinking about using this technology.
10. I do not feel unsettled at all when thinking about using this technology.

A.2 Probability x Severity Items

For the next set of questions, you are going to be reporting your beliefs about the probability and severity of outcomes from using a specific technology.

You have a total of 10 points to divide among the five items based on how likely you think they are to occur. The total number of points for each set of questions must equal 10.

Higher numbers mean a higher expected probability that type of outcome will occur.

Lower numbers mean a lower expected probability that type of outcome will occur.

A 0 means that that outcome is not expected at all.

When thinking about using _____, please rate your expected probability for the following outcomes:

1. Catastrophic

- i. The outcomes of using this technology will be completely catastrophic.
- ii. The outcomes of using this technology will be very catastrophic.
- iii. The outcome of using this technology will be somewhat catastrophic.
- iv. The outcomes of using this technology will be slightly catastrophic.
- v. The outcomes of using this technology will not at all catastrophic.

2. Disastrous

- i. A completely disastrous outcome will result from using this technology.
- ii. A considerably disastrous outcome will result from using this technology.
- iii. A moderately disastrous outcome will result from using this technology.
- iv. A slightly disastrous outcome will result from using this technology.
- v. There will be no disastrous outcome from using this technology.

3. Destructive

- i. The outcomes of using this technology will be extremely destructive.
- ii. The outcomes of using this technology will be very destructive.
- iii. The outcomes of using this technology will be somewhat destructive.
- iv. The outcomes of using this technology will be slightly destructive.
- v. The outcomes of using the technology will not be destructive at all.

4. Tragic

- i. Using this technology will result in extremely tragic outcomes.
- ii. Using this technology will result in very tragic outcomes.
- iii. Using this technology will result in somewhat tragic outcomes.
- iv. Using this technology will result in slightly tragic outcomes.
- v. Using this technology will not result in any tragic outcomes at all.

5. Severe

- i. Using this technology will result in extremely severe outcomes.
- ii. Using this technology will result in very severe outcomes.
- iii. Using this technology will result in somewhat severe outcomes.
- iv. Using this technology will result in slightly severe outcomes.
- v. Using this technology will not result in any severe outcomes.

6. Dreadful

- i. The outcomes of using this technology will be completely dreadful.
- ii. The outcomes of using this technology will be considerably dreadful.
- iii. The outcomes of using this technology will be moderately dreadful.
- iv. The outcomes of using this technology will be slightly dreadful.
- v. The outcomes of using this technology will not be dreadful at all.

7. Awful

- i. There will be completely awful outcomes as a result of using this technology.
- ii. There will very awful outcomes as a result of using this technology.
- iii. There will be somewhat awful outcomes as a result of using this technology.
- iv. There will be slightly awful outcomes as a result of using this technology.
- v. There will be no awful outcomes at all as a result of using this technology.

8. Bad

- i. The outcomes of using this technology will be extremely bad.
- ii. The outcomes of using this technology will be very bad.
- iii. The outcomes of using this technology will be somewhat bad.
- iv. The outcomes of using this technology will be slightly bad.
- v. The outcomes of using this technology will not be bad at all.

9. Unpleasant

- i. Using this technology will result in extremely unpleasant results.
- ii. Using this technology will result in very unpleasant results.
- iii. Using this technology will result in somewhat unpleasant results.
- iv. Using this technology will results in slightly unpleasant results.
- v. Using this technology will not result in any unpleasant results.

A.3 Domain Item

When someone is evaluating the risks of using _____, in what order would you recommend they consider the following domains of risk specific to that technology?

Rank from **most important (1)** to consider, to **least important (9)** to consider.

- Physical Harm Risk (the technology could hurt or kill someone)
- Financial Risk (the technology could cause someone to lose money or cost a lot)
- Performance Risk (the technology could function improperly or not completing the tasks could cause other negative outcomes)
- Social Risk (the technology could influence how other people think of the person using it)
- Psychological Risk (the technology could cause emotional or psychological harm or not align with how the user thinks of themselves)
- Time Loss Risk (the technology could be late, delayed, inefficient, or require extra effort)
- Ethical Risk (the technology could be immoral)
- Privacy Risk (the technology could expose the user or their environment)
- Security Risk (the technology could be vulnerable to misuse or is a threat to safety)

For this next question, you will be evaluating if there are domains from the ranking that do not need to be considered at all. You will evaluate the domains in the order you previously ranked them. If there are domains that do not need to be considered after a certain rank, you will provide a cut-off after which items do not need to be considered by selecting the last domain in the rank ordering that needs to be considered. If all domains are important to consider, please select the final item (9).

You rank ordered the following list of items from most important (1) to least important (9) to consider when evaluating the risk of **using x**.

Please select the last domain which you think someone should consider **when using x**. For example, maybe no domains after the 4th ranked domain matter so you would select the 4th ranked domain; or, in cases where all domains could be important to consider, select the last item.

- Physical Harm Risk (the technology could hurt or kill someone)
- Financial Risk (the technology could cause someone to lose money or cost a lot)
- Performance Risk (the technology could function improperly or not completing the tasks could cause other negative outcomes)
- Social Risk (the technology could influence how other people think of the person using it)
- Psychological Risk (the technology could cause emotional or psychological harm or not align with how the user thinks of themselves)
- Time Loss Risk (the technology could be late, delayed, inefficient, or require extra effort)
- Ethical Risk (the technology could be immoral)
- Privacy Risk (the technology could expose the user or their environment)
- Security Risk (the technology could be vulnerable to misuse or is a threat to safety)

APPENDIX B. PERCEIVED RELATIONAL RISK: SHORT SCALE

B.1 Affect Items

Likert-style questions, rated on level of agreement with each statement: (1-Strongly disagree, 2-Disagree, 3-Somewhat disagree, 4-Neither agree nor disagree, 5-Somewhat agree, 6-Agree, 7-Strongly agree).

1. I am very concerned about using this technology.
2. I am very fearful of using this technology.
3. I am very anxious about using this technology.
4. I am very concerned about the effects that using this technology could have on people close to me (e.g., friends and family).
5. I am very concerned about the effects that using this technology could have on the general public.
6. Thinking about using this technology makes me feel very frightened.
7. Thinking about using this technology does not worry me at all. (RC)*
8. I have no concerns about the effects that using this technology could have on me. (RC)
9. I am calm when thinking about using this technology. (RC)
10. I do not feel any distress when thinking about using this technology. (RC)

*Items need to be reverse coded.

B.2 Probability x Severity Items

For the next set of questions, you are going to be reporting your beliefs about the probability and severity of outcomes from using a specific technology.

You have a total of 10 points to divide among the five items based on how likely you think they are to occur. The total number of points for each set of questions must equal 10.

Higher numbers mean a higher expected probability that type of outcome will occur.

Lower numbers mean a lower expected probability that type of outcome will occur.

A 0 means that that outcome is not expected at all.

When thinking about using _____, please rate your expected probability for the following outcomes:

1.. Disastrous

- i. A completely disastrous outcome will result from using this technology.
- ii. A considerably disastrous outcome will result from using this technology.
- iii. A moderately disastrous outcome will result from using this technology.
- iv. A slightly disastrous outcome will result from using this technology.
- v. There will be no disastrous outcome from using this technology.

2. Tragic

- i. Using this technology will result in extremely tragic outcomes.
- ii. Using this technology will result in very tragic outcomes.
- iii. Using this technology will result in somewhat tragic outcomes.
- iv. Using this technology will result in slightly tragic outcomes.
- v. Using this technology will not result in any tragic outcomes at all.

3. Severe

- i. Using this technology will result in extremely severe outcomes.
- ii. Using this technology will result in very severe outcomes.
- iii. Using this technology will result in somewhat severe outcomes.
- iv. Using this technology will result in slightly severe outcomes.
- v. Using this technology will not result in any severe outcomes.

4. Awful

- i. There will be completely awful outcomes as a result of using this technology.
- ii. There will very awful outcomes as a result of using this technology.
- iii. There will be somewhat awful outcomes as a result of using this technology.
- iv. There will be slightly awful outcomes as a result of using this technology.
- v. There will be no awful outcomes at all as a result of using this technology.

5. Unpleasant

- i. Using this technology will result in extremely unpleasant results.
- ii. Using this technology will result in very unpleasant results.
- iii. Using this technology will result in somewhat unpleasant results.
- iv. Using this technology will results in slightly unpleasant results.
- v. Using this technology will not result in any unpleasant results.

B.3 Domain Items

When someone is evaluating the risks of using ____, in what order would you recommend they consider the following domains of risk specific to that technology?

Rank from **most important (1)** to consider, to **least important (9)** to consider.

- Physical Harm Risk (the technology could hurt or kill someone)
- Financial Risk (the technology could cause someone to lose money or cost a lot)
- Performance Risk (the technology could function improperly or not completing the tasks could cause other negative outcomes)
- Social Risk (the technology could influence how other people think of the person using it)
- Psychological Risk (the technology could cause emotional or psychological harm or not align with how the user thinks of themselves)
- Time Loss Risk (the technology could be late, delayed, inefficient, or require extra effort)
- Ethical Risk (the technology could be immoral)
- Privacy Risk (the technology could expose the user or their environment)
- Security Risk (the technology could be vulnerable to misuse or is a threat to safety)

For this next question, you will be evaluating if there are domains from the ranking that do not need to be considered at all. You will evaluate the domains in the order you previously ranked them. If there are domains that do not need to be considered after a certain rank, you will provide

a cut-off after which items do not need to be considered by selecting the last domain in the rank ordering that needs to be considered. If all domains are important to consider, please select the final item (9).

You rank ordered the following list of items from most important (1) to least important (9) to consider when evaluating the risk of **using x**.

Please select the last domain which you think someone should consider **when using x**. For example, maybe no domains after the 4th ranked domain matter so you would select the 4th ranked domain; or, in cases where all domains could be important to consider, select the last item.

- Physical Harm Risk (the technology could hurt or kill someone)
- Financial Risk (the technology could cause someone to lose money or cost a lot)
- Performance Risk (the technology could function improperly or not completing the tasks could cause other negative outcomes)
- Social Risk (the technology could influence how other people think of the person using it)
- Psychological Risk (the technology could cause emotional or psychological harm or not align with how the user thinks of themselves)
- Time Loss Risk (the technology could be late, delayed, inefficient, or require extra effort)
- Ethical Risk (the technology could be immoral)
- Privacy Risk (the technology could expose the user or their environment)
- Security Risk (the technology could be vulnerable to misuse or is a threat to safety)

APPENDIX C. PERCEIVED SITUATIONAL RISK: FULL SCALE

C.1 Affect Items

Rated on level of agreement with each statement: (1-Strongly disagree, 2-Disagree, 3-Somewhat disagree, 4-Neither agree nor disagree, 5-Somewhat agree, 6-Agree, 7-Strongly agree).

Negative Items

1. I am very concerned about completing this task or being in this situation.
2. I am very fearful of completing this task or being in this situation.
3. I am very anxious about completing this task or being in this situation.
4. I am very nervous of completing this task or being in this situation.
5. I am very concerned about the effects that completing this task or being in this situation could have on me.
6. I am very concerned about the effects that completing this task or being in this situation could have on people close to me (e.g., friends and family).
7. I am very concerned about the effects that completing this task or being in this situation could have on the general public.
8. Thinking about completing this task or being in this situation makes me feel very distressed.
9. Thinking about completing this task or being in this situation makes me feel very worried.
10. Thinking about completing this task or being in this situation makes me feel very frightened.

Positive items

1. Thinking about completing this task or being in this situation does not worry me at all.
2. Completing this task or being in this situation is not threatening to me at all.
3. I have no concerns about the effects that completing this task or being in this situation could have on me.
4. I have no worries about the effects that completing this task or being in this situation could have on people close to me (e.g., friends and family).
5. I have no worries about the effects that completing this task or being in this situation could have on the general public.
6. I am calm when thinking about completing this task or being in this situation.
7. I do not feel any anxiety when thinking about completing this task or being in this situation.
8. I feel peaceful when thinking about completing this task or being in this situation.
9. I do not feel any distress when thinking about completing this task or being in this situation.
10. I do not feel unsettled at all when thinking about completing this task or being in this situation.

C.2 Probability x Severity Items

For the next set of questions, you are going to be reporting your beliefs about the probability and severity of outcomes from using a specific technology.

You have a total of 10 points to divide among the five items based on how likely you think they are to occur. The total number of points for each set of questions must equal 10.

Higher numbers mean a higher expected probability that type of outcome will occur.

Lower numbers mean a lower expected probability that type of outcome will occur.

A 0 means that that outcome is not expected at all.

When thinking about using _____, please rate your expected probability for the following outcomes:

1. Catastrophic

- i. The outcomes of completing this task or being in this situation will be completely catastrophic.
- ii. The outcomes of completing this task or being in this situation will be very catastrophic.
- iii. The outcome of completing this task or being in this situation will be somewhat catastrophic.
- iv. The outcomes of completing this task or being in this situation will be slightly catastrophic.
- v. The outcomes of completing this task or being in this situation will not at all catastrophic.

2. Disastrous

- i. A completely disastrous outcome will result from completing this task or being in this situation.
- ii. A considerably disastrous outcome will result from completing this task or being in this situation.
- iii. A moderately disastrous outcome will result from completing this task or being in this situation.
- iv. A slightly disastrous outcome will result from completing this task or being in this situation.
- v. There will be no disastrous outcome from completing this task or being in this situation.

3. Destructive

- i. The outcomes of completing this task or being in this situation will be extremely destructive.
- ii. The outcomes of completing this task or being in this situation will be very destructive.
- iii. The outcomes of completing this task or being in this situation will be somewhat destructive.
- iv. The outcomes of completing this task or being in this situation will be slightly destructive.
- v. The outcomes of completing this task or being in this situation will not be destructive at all.

4. Tragic

- i. Completing this task or being in this situation will result in extremely tragic outcomes.
- ii. Completing this task or being in this situation will result in very tragic outcomes.
- iii. Completing this task or being in this situation will result in somewhat tragic outcomes.
- iv. Completing this task or being in this situation will result in slightly tragic outcomes.
- v. Completing this task or being in this situation will not result in any tragic outcomes at all.

5. Severe

- i. Completing this task or being in this situation will result in extremely severe outcomes.
- ii. Completing this task or being in this situation will result in very severe outcomes.
- iii. Completing this task or being in this situation will result in somewhat severe outcomes.
- iv. Completing this task or being in this situation will result in slightly severe outcomes.
- v. Completing this task or being in this situation will not result in any severe outcomes.

6. Dreadful

- i. The outcomes of completing this task or being in this situation will be completely dreadful.
- ii. The outcomes of completing this task or being in this situation will be considerably dreadful.
- iii. The outcomes of completing this task or being in this situation will be moderately dreadful.
- iv. The outcomes of completing this task or being in this situation will be slightly dreadful.
- v. The outcomes of completing this task or being in this situation will not be dreadful at all.

7. Awful

- i. There will be completely awful outcomes as a result of completing this task or being in this situation.
- ii. There will very awful outcomes as a result of completing this task or being in this situation.
- iii. There will be somewhat awful outcomes as a result of completing this task or being in this situation.
- iv. There will be slightly awful outcomes as a result of completing this task or being in this situation.
- v. There will be no awful outcomes at all as a result of completing this task or being in this situation.

8. Bad

- i. The outcomes of completing this task or being in this situation will be extremely bad.
- ii. The outcomes of completing this task or being in this situation will be very bad.
- iii. The outcomes of completing this task or being in this situation will be somewhat bad.
- iv. The outcomes of completing this task or being in this situation will be slightly bad.
- v. The outcomes of completing this task or being in this situation will not be bad at all.

9. Unpleasant

- i. Completing this task or being in this situation will result in extremely unpleasant results.
- ii. Completing this task or being in this situation will result in very unpleasant results.
- iii. Completing this task or being in this situation will result in somewhat unpleasant results.
- iv. Completing this task or being in this situation will result in slightly unpleasant results.
- v. Completing this task or being in this situation will not result in any unpleasant results.

10. Disappointing

- i. There will be completely disappointing outcomes as a result of completing this task or being in this situation.
- ii. There will be considerably disappointing outcomes as a result of completing this task or being in this situation.
- iii. There will be moderately disappointing outcomes as a result of completing this task or being in this situation.
- iv. There will be slightly disappointing outcomes as a result of completing this task or being in this situation.
- v. There will be no disappointing outcomes as a result of completing this task or being in this situation.

C.3 Domain Items

When someone is evaluating the risks of doing ____, in what order would you recommend they consider the following domains of risk specific to that task or situation?

Rank from **most important (1)** to consider, to **least important (9)** to consider.

- Physical Harm Risk (the task or situation could hurt or kill someone)
- Financial Risk (the task or situation could cause someone to lose money or cost a lot)
- Performance Risk (if improperly or not completed the task or situation could cause other negative outcomes)
- Social Risk (the task or situation could influence how other people think of the person doing the task or in the situation)
- Psychological Risk (the task or situation could cause emotional or psychological harm or not align with how the person thinks of themselves)
- Time Loss Risk (the task or situation is inefficient or requires extra effort)
- Ethical Risk (the task or situation could be immoral)
- Privacy Risk (the task or situation could expose the user or their environment)
- Security Risk (the task or situation could be vulnerable to misuse or is a threat to safety)

For this next question, you will be evaluating if there are domains from the ranking that do not need to be considered at all. You will evaluate the domains in the order you previously ranked them. If there are domains that do not need to be considered after a certain rank, you will provide a cut-off after which items do not need to be considered by selecting the last domain in the rank ordering that needs to be considered. If all domains are important to consider, please select the final item (9).

You rank ordered the following list of items from most important (1) to least important (9) to consider when evaluating the risk of **doing x**.

Please select the last domain which you think someone should consider **when doing x**. For example, maybe no domains after the 4th ranked domain matter so you would select the 4th ranked domain; or, in cases where all domains could be important to consider, select the last item

- Physical Harm Risk (the task or situation could hurt or kill someone)
- Financial Risk (the task or situation could cause someone to lose money or cost a lot)
- Performance Risk (if improperly or not completed the task or situation could cause other negative outcomes)
- Social Risk (the task or situation could influence how other people think of the person doing the task or in the situation)
- Psychological Risk (the task or situation could cause emotional or psychological harm or not align with how the person thinks of themselves)
- Time Loss Risk (the task or situation is inefficient or requires extra effort)
- Ethical Risk (the task or situation could be immoral)
- Privacy Risk (the task or situation could expose the user or their environment)
- Security Risk (the task or situation could be vulnerable to misuse or is a threat to safety)

APPENDIX D. PERCEIVED SITUATIONAL RISK: SHORT SCALE

D.1 Affect Items

Rated on level of agreement with each statement: (1-Strongly disagree, 2-Disagree, 3-Somewhat disagree, 4-Neither agree nor disagree, 5-Somewhat agree, 6-Agree, 7-Strongly agree).

1. I am very concerned about completing this task or being in this situation.
2. I am very fearful of completing this task or being in this situation.
3. I am very concerned about the effects that completing this task or being in this situation could have on me.
4. I am very concerned about the effects that completing this task or being in this situation could have on people close to me (e.g., friends and family).
5. I am very concerned about the effects that completing this task or being in this situation could have on the general public.
6. Thinking about completing this task or being in this situation does not worry me at all. (RC)*
7. Completing this task or being in this situation is not threatening to me at all. (RC)
8. I am calm when thinking about completing this task or being in this situation. (RC)
9. I do not feel any anxiety when thinking about completing this task or being in this situation. (RC)
10. I do not feel any distress when thinking about completing this task or being in this situation. (RC)

*Items need to be reverse coded.

D.2 Probability x Severity Items

For the next set of questions, you are going to be reporting your beliefs about the probability and severity of outcomes from using a specific technology.

You have a total of 10 points to divide among the five items based on how likely you think they are to occur. The total number of points for each set of questions must equal 10.

Higher numbers mean a higher expected probability that type of outcome will occur.

Lower numbers mean a lower expected probability that type of outcome will occur.

A 0 means that that outcome is not expected at all.

When thinking about using _____, please rate your expected probability for the following outcomes:

1. Catastrophic

- i. The outcomes of completing this task or being in this situation will be completely catastrophic.
- ii. The outcomes of completing this task or being in this situation will be very catastrophic.
- iii. The outcome of completing this task or being in this situation will be somewhat catastrophic.
- iv. The outcomes of completing this task or being in this situation will be slightly catastrophic.
- v. The outcomes of completing this task or being in this situation will not at all catastrophic.

2. Disastrous

- i. A completely disastrous outcome will result from completing this task or being in this situation.
- ii. A considerably disastrous outcome will result from completing this task or being in this situation.
- iii. A moderately disastrous outcome will result from completing this task or being in this situation.
- iv. A slightly disastrous outcome will result from completing this task or being in this situation.
- v. There will be no disastrous outcome from completing this task or being in this situation.

3. Severe

- i. Completing this task or being in this situation will result in extremely severe outcomes.
- ii. Completing this task or being in this situation will result in very severe outcomes.
- iii. Completing this task or being in this situation will result in somewhat severe outcomes.
- iv. Completing this task or being in this situation will result in slightly severe outcomes.
- v. Completing this task or being in this situation will not result in any severe outcomes.

4. Awful

- i. There will be completely awful outcomes as a result of completing this task or being in this situation.
- ii. There will very awful outcomes as a result of completing this task or being in this situation.
- iii. There will be somewhat awful outcomes as a result of completing this task or being in this situation.
- iv. There will be slightly awful outcomes as a result of completing this task or being in this situation.
- v. There will be no awful outcomes at all as a result of completing this task or being in this situation.

5. Unpleasant

- i. Completing this task or being in this situation will result in extremely unpleasant results.
- ii. Completing this task or being in this situation will result in very unpleasant results.
- iii. Completing this task or being in this situation will result in somewhat unpleasant results.
- iv. Completing this task or being in this situation will results in slightly unpleasant results.
- v. Completing this task or being in this situation will not result in any unpleasant results.

D.3 Domain Item

When someone is evaluating the risks of doing ____, in what order would you recommend they consider the following domains of risk specific to that task or situation?

Rank from **most important (1)** to consider, to **least important (9)** to consider.

- Physical Harm Risk (the task or situation could hurt or kill someone)
- Financial Risk (the task or situation could cause someone to lose money or cost a lot)
- Performance Risk (if improperly or not completed the task or situation could cause other negative outcomes)
- Social Risk (the task or situation could influence how other people think of the person doing the task or in the situation)
- Psychological Risk (the task or situation could cause emotional or psychological harm or not align with how the person thinks of themselves)
- Time Loss Risk (the task or situation is inefficient or requires extra effort)
- Ethical Risk (the task or situation could be immoral)
- Privacy Risk (the task or situation could expose the user or their environment)
- Security Risk (the task or situation could be vulnerable to misuse or is a threat to safety)

For this next question, you will be evaluating if there are domains from the ranking that do not need to be considered at all. You will evaluate the domains in the order you previously ranked them. If there are domains that do not need to be considered after a certain rank, you will provide a cut-off after which items do not need to be considered by selecting the last domain in the rank ordering that needs to be considered. If all domains are important to consider, please select the final item (9).

You rank ordered the following list of items from most important (1) to least important (9) to consider when evaluating the risk of **doing x**.

Please select the last domain which you think someone should consider **when doing x**. For example, maybe no domains after the 4th ranked domain matter so you would select the 4th ranked domain; or, in cases where all domains could be important to consider, select the last item

- Physical Harm Risk (the task or situation could hurt or kill someone)
- Financial Risk (the task or situation could cause someone to lose money or cost a lot)
- Performance Risk (if improperly or not completed the task or situation could cause other negative outcomes)
- Social Risk (the task or situation could influence how other people think of the person doing the task or in the situation)
- Psychological Risk (the task or situation could cause emotional or psychological harm or not align with how the person thinks of themselves)
- Time Loss Risk (the task or situation is inefficient or requires extra effort)
- Ethical Risk (the task or situation could be immoral)
- Privacy Risk (the task or situation could expose the user or their environment)
- Security Risk (the task or situation could be vulnerable to misuse or is a threat to safety)